ABSTRACT

[0110] In certain embodiments of the invention, a plurality of images of one or more subjects may be captured using different imaging techniques, such as different modalities of scanning probe microscopy. Parameters may be estimated from the plurality of images, using one or more models of known molecular structures to provide a model-based analysis. The estimated parameters may be fused, with further input from physical models of known molecular structures. The fused parameters may be used to characterize the subjects. Such characterization may include the detection and/or identification of specific molecular structures, such as proteins, peptides and/or nucleic acids of known sequence and/or structure. In some embodiments of the invention the structural characterizations may be used to identify previously unknown properties of a subject molecule.